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Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination

Research on market orientation and organizational learning addresses how organizations adapt to their environments and develop competitive advantage. A significant void exists in current models of market orientation because none of the frameworks incorporates constructs related to innovation. The authors present a conceptual framework for incorporating constructs that pertain to innovation in market orientation research. Some of the critical relationships in this conceptual framework are tested among a sample of 9648 employees from 56 organizations in a large agency of the U.S. federal government. The results indicate that higher levels of innovativeness in the firms' culture are associated with a greater capacity for adaptation and innovation (number of innovations successfully implemented). In addition, higher levels of innovativeness are associated with cultures that emphasize learning, development, and participative decision making. The authors make recommendations for incorporating constructs related to innovation into research on market orientation and organizational learning.

It is nearly impossible to find an industry that is not engaged in continuous or periodic innovation and reorientation due to the dynamic nature of most markets. Researchers in marketing suggest that *market orientation* is a set of specific behaviors and activities (Kohli and Jaworski 1990), a resource (Hunt and Morgan 1995), a basis for decision making (Shapiro 1988), or an aspect of organizational culture (Day 1994; Deshpandé, Farley, and Webster 1993; Slater and Narver 1995). Slater and Narver (1995) clearly assert that market orientation (1) is an aspect of organizational culture, (2) is inherently a learning orientation, and (3) requires more research to understand the norms and values that enhance both it and organizational learning. According to Slater and Narver (1995, p. 63), such research enhances effectiveness by explaining the "process of learning, behavior change and performance improvement."

Sinkula's (1994) and Slater and Narver's (1995) introductions of the organizational learning construct to marketing represent an important shift in this stream of research. Slater and Narver suggest that market orientation only enhances performance when it is combined with a learning orientation. They further suggest that the "market-driven business is well positioned to anticipate the developing needs of customers and to respond to them through the addition of innovative products and services. This ability gives the market-driven business an advantage in the speed and effectiveness of its response to opportunities and threats. Thus, a market orientation is inherently a learning orientation" (p. 67). Although this shift from market orientation to learning organization is a valuable contribution, Slater and Narver's quote points to a contradiction. On the one hand, they suggest that market orientation and learning orientation are inherent or inseparable. On the other hand, they indicate that a learning orientation mediates the market orientation–performance linkage.

The apparent contradiction in Slater and Narver's (1995) framework can be resolved by incorporating constructs related to innovation into these models. In this article, we argue that models of market orientation should focus on innovation (implementation of new ideas, products, or processes) rather than learning (development of knowledge and insights) as the primary mechanism for responding to markets. Furthermore, market and learning orientations both are separate antecedents of an innovative culture. Organizations whose cultures emphasize innovation when resources are available tend to implement more innovations and develop competitive advantage.

This article provides an in-depth integration of the constructs pertaining to organizational culture and innovation with the research on market and learning orientations. We contribute to this literature in four ways. First, we review the overlap between research on market and learning orientation and studies of innovation. Second, we present a conceptual framework for incorporating innovation constructs into this line of research. The framework clarifies the relationship between market and learning orientations and organizational innovativeness. Third, we empirically test some of the critical relationships in the conceptual model that link innova-

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Journal of Marketing
Vol. 62 (July 1998), 42–54

tion to organizational learning and the firm's ability to adapt to the external environment. Fourth, we examine learning orientation in a new setting, a nonprofit U.S. government agency. This broadens the application of the market and learning orientation paradigm at a time when nonprofit organizations (e.g., NASA, NATO, United Nations, World Bank) are under increased pressure to be responsive to their external environments.

Literature Review

Market and Learning Orientations as Organizational Culture

Before examining the literature that deals with market and learning orientations, we place this topic in the context of related research. Researchers have touched on it from a strategy perspective (Corey and Star 1971; Day 1994), an organizational design perspective (Webster 1992, 1994), a market information processing perspective (Deshpandé and Zaltman 1982; Menon and Varadarajan 1992; Moorman 1995), a product and service customization perspective (Pine, Victor, and Boynton 1993), and a network perspective (Haeckel 1995). In addition to this work, there is extensive literature that focuses more directly on what it means to be market or learning oriented.

Kohli and Jaworski (1990) define *market orientation* as the organization-wide generation of market intelligence that pertains to current and future customer needs, dissemination of intelligence across departments, and organization-wide responsiveness. Although Kohli and Jaworski cite some of the literature that links organizational norms and values to the marketing concept, they do not indicate that market orientation is an aspect of culture. Conversely, Deshpandé, Farley, and Webster (1993) focus on customer orientation and conceptualize it as an aspect of corporate culture. Similarly, Slater and Narver (1995, p. 67) define market orientation as "the culture that (1) places the highest priority on the profitable creation and maintenance of superior customer value while considering the interests of other stakeholders; and (2) provides norms for behavior regarding the organizational development and responsiveness to market information." Day's (1994, p. 43) view is that "a market-driven culture supports the value of thorough market intelligence and the necessity of functionally coordinated action directed at gaining a competitive advantage." This conceptualization is similar to Slater and Narver's, in that Day suggests that market orientation, combined with organizational capabilities (the ability to apply learning), enhances performance.

Recent research suggests that, from a measurement perspective, treating market orientation as a set of behaviors and processes rather than as an aspect of culture (i.e., values and beliefs) may have some benefit but that both perspectives are valuable. Deshpandé and Farley (1996) suggest that market orientation be measured from an activities perspective (i.e., a set of behaviors and processes) but recognize that this involves ignoring cultural manifestations. Jaworski and Kohli (1996) study the differences in the cultural and behavioral definitions of market orientation and conclude that both have merit. We argue that both market and learning orientation can be manifest at various levels in an organization (i.e., the firm's strategy, processes, structure, behaviors, and culture). Drawing on culture literature, we go further to suggest that the deepest manifestations of market and learning orientations are at the cultural level, where over time, stories, reinforcement of behaviors, and the creation of organizational processes produce a basic assumption among employees that customers and learning are important (cf. Schein 1985).

Deshpandé and Webster (1989, p. 4) define *culture* as a "set of shared assumptions and understandings about organization functioning." Day (1994) suggests that culture unifies organizational capabilities into a cohesive whole. The theoretical argument about culture is that it is a complex system of norms and values that is shaped over time and affects the types and variance of organizational processes and behaviors (Barney 1986; Schein 1985). Strong support exists in marketing literature that market orientation can be embedded in the culture of an organization and affect market vigilance and action.

Market and Learning Orientations as Antecedents to Innovation

Kohli and Jaworski (1990) refer to the action component of market orientation as organization-wide responsiveness to market information. More recently, Jaworski and Kohli (1993, p. 56) have suggested that, because "a market orientation essentially involves doing something new or different in response to market conditions, it may be viewed as a form of innovative behavior." Jaworski and Kohli do not deal with innovation explicitly in their model, though in subsequent work (Jaworski and Kohli 1996), they suggest that market orientation is an antecedent to innovation. Although Jaworski and Kohli (1996) regard innovation as an outcome of market orientation, they do not recognize that innovativeness can be an aspect of a group's culture, just as a market orientation can be manifest in culture.

Slater and Narver (1995) take a somewhat different approach to action and responsiveness to markets by introducing the construct of organizational learning. They suggest that without the ability to use and act on information (applied learning), market orientation would not have a positive effect on performance; that is, market orientation promotes organizational learning, and the organization's ability to learn then enhances performance. Drawing on Huber's (1991) work, they define *organizational learning* as the development of new knowledge or insights that have the potential to influence behavior.

The importance of organizational learning and the generation of new behaviors as central factors in models of market orientation brings forth the following question: If market orientation requires the adoption of new behaviors (innovation), why is the construct of innovation absent in all of the existing models of market orientation? In a recent commentary, Slater (1997, p. 165) touched briefly on the idea that "successful innovation is the product of a market oriented culture coupled with entrepreneurial values." Also, Jaworski and Kohli (1996) recently have recognized that innovation has been inappropriately absent in models of market orientation. Prior to these articles, only Deshpandé, Farley, and Webster (1993) and Menon and Varadarajan

(1992) had related the market orientation construct to both culture and organizational innovativeness. Menon and Varadarajan suggest that a pro-innovation culture facilitates information sharing and use. In the only empirical work that has examined innovation and customer orientation, Deshpandé, Farley, and Webster (1993) find that market- and entrepreneurial-oriented cultures outperformed those that were more internally or hierarchically oriented. Deshpandé, Farley, and Webster (1993, p. 24) suggest that the "fundamental question is whether customer orientation, as it relates to corporate culture and in concert with organizational innovativeness, has a measurable impact on business performance."

Slater and Narver (1995) fail to address innovation in their conceptual model, but they do suggest that an entrepreneurial culture promotes organizational learning. Although they use the term "innovation" occasionally, they concentrate on entrepreneurship in their framework. As several researchers have noted, the central idea underlying entrepreneurship is new entry, that is, entering new or established markets with new or existing goods (Lumpkin and Dess 1996; Schendel 1990; Slater and Narver 1995). Innovation, however, is a broader concept that addresses the implementation of new ideas, products, or processes (Thompson 1965). Innovation might not involve entering new markets. For example, the Xerox Corporation's implementation of total quality management was market-driven and would be classified as an administrative innovation; however, it had nothing to do with entrepreneurship or new entry (Hurley 1994). Focusing on entrepreneurship rather than innovation limits our understanding of market- and learning-oriented companies and the mechanisms by which those firms respond to their environments. Furthermore, emphasizing innovation rather than entrepreneurship is particularly important in broadening the market orientation paradigm to nonprofit organizations, in which responsiveness to stakeholders could involve implementing new ideas but not new entry.

A careful examination of the literature on innovation reveals that researchers would be hard-pressed to make the case that market and learning orientations are not simply antecedents or phases of a process that could be labeled "market-driven innovation." Being oriented toward markets provides a source of ideas for change and improvement; being oriented toward learning indicates an appreciation for and desire to assimilate new ideas. As we review in more detail subsequently, both of these aspects of organizational culture have been conceptualized as antecedents to innovation. Organizational learning (knowledge or insights that influence behavior) and innovation overlap in Thompson's (1965, p. 36) classic definition of *innovation* as the "generation, acceptance and implementation of new ideas, processes, products or services." A similar overlap is evident in Zaltman, Duncan, and Holbek's (1973, p. 2) definition of *innovation* as "an idea, practice or material artifact perceived as new by the relevant unit of adoption." More recently, we find the overlap between organizational learning and *innovation* in Amabile and colleagues' (1996, p. 25) definition of innovation as the "successful implementation of creative ideas within an organization." Given this overlap, it is remarkable that constructs regarding innovation are absent in models of market and learning orientation.

Incorporating the Construct of Innovation

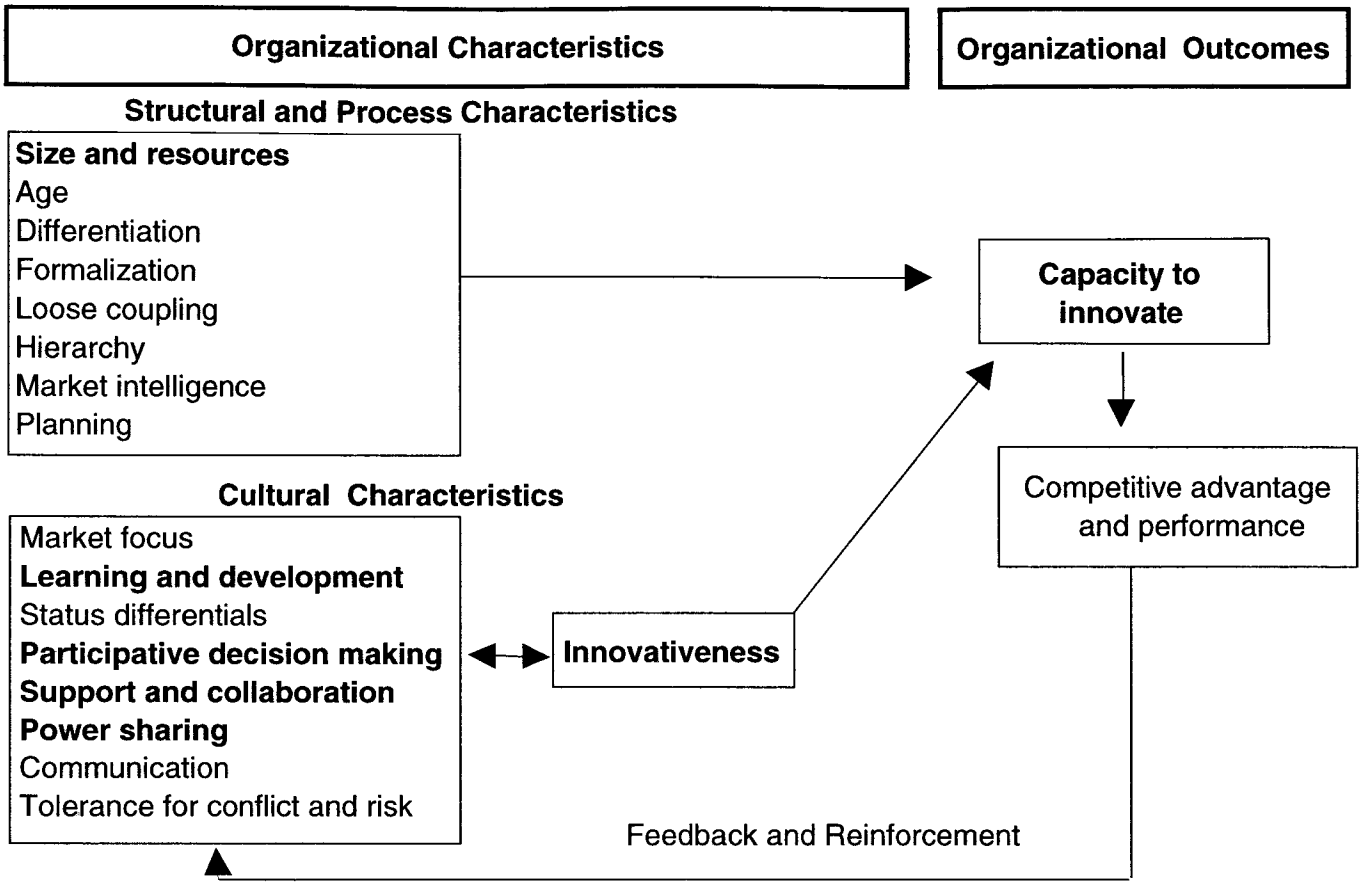
An examination of the stages of the innovation process sheds more light on how organizational culture affects innovation and performance and how organizational learning is an antecedent to an innovative culture. Zaltman, Duncan, and Holbek (1973) suggest that the two different stages of the innovation process are initiation and implementation. A critical part of the initiation stage is "openness to the innovation" (Zaltman, Duncan, and Holbek 1973, p. 64), which is determined by whether the members of an organization are willing to consider the adoption of or are resistant to innovation. Van de Ven (1986) refers to this as the management of the firm's attention in order to recognize the need for new ideas and action in the organization.

Drawing on Zaltman, Duncan, and Holbek's (1973) differentiation of the initiation and implementation stages of innovation, we introduce two innovation constructs into models of market orientation: (1) innovativeness and (2) the capacity to innovate. *Innovativeness* is the notion of openness to new ideas as an aspect of a firm's culture. Innovativeness of the culture is a measure of the organization's orientation toward innovation. We argue that there are antecedents to innovativeness; that is, various characteristics of a firm's culture, such as an emphasis on learning, participative decision making, support and collaboration, and power sharing, affect whether the firm has an innovation orientation.

The *capacity to innovate*, a term first used by Burns and Stalker (1961), is the ability of the organization to adopt or implement new ideas, processes, or products successfully. This definition underscores our emphasis on what Rogers (1983) refers to as the prediffusion aspect of innovation, that is, early production or adoption of innovation by an organization rather than the diffusion of innovation among buyers after first adoption. The innovativeness of the firm's culture acts in concert with various structural properties of the company to affect the innovative capacity of the organization. Innovative capacity relates to what Cohen and Levinthal (1990) call *absorptive capacity*. This capacity can be measured by the number of innovations an organization is able to adopt or implement successfully. Innovativeness of the firm's culture, when combined with resources and other organizational characteristics, creates a greater capacity to innovate. Firms that have a greater capacity to innovate are able to develop a competitive advantage and achieve higher levels of performance.

Figure 1 incorporates innovativeness (organizational culture) and innovative capacity (an organizational outcome) as variables in a model of how firms adapt, develop capabilities, and gain competitive advantage. In this conceptualization, innovation replaces organizational learning as the central mechanism by which organizations develop capabilities and adapt to their environments. Learning orientation, along with other aspects of organizational culture, functions as an antecedent to an innovation orientation. It is the orientation to innovation and the capacity to implement innovations that determine whether the organization's mar-

FIGURE 1
Organization and Market Driven Innovation



Note: The variables in bold are used in the empirical portion of the article to test critical relationships in this conceptual model. The remaining variables appear in order of comprehensiveness of the conceptual part of the article.

ket and learning orientations will lead to the development of the firm and the achievement of superior performance. This clarifies the confound in Slater and Narver's (1995) model. Market orientation, learning orientation, innovativeness, and innovative capacity are organizational properties that affect the innovation process. A market- and learning-oriented culture, along with other factors, promotes a receptivity to new ideas and innovation as part of an organization's culture (innovativeness). Innovativeness in an organization's culture, when adequate resources are present, facilitates the implementation of innovations (innovative capacity). Firms with greater capacity to innovate will be more successful in responding to their environments and developing new capabilities that lead to competitive advantage and superior performance.

Changing the conceptualization of market and learning orientation to incorporate innovation has many advantages. If we use the more stringent definition of learning, which requires that it appear in new behaviors (Argyris and Schon 1978; Fiol and Lyles 1985), then organizational learning is synonymous with the capacity to innovate. By focusing on innovation, we avoid the problem of trying to measure changes in knowledge. Sinkula (1994) refers to this demonstration of learning as augmented knowledge, recognizing that the ability to apply knowledge implies a greater level of learning. Also, by introducing the constructs of organizational innovativeness and innovative capacity, we focus our inquiry on innovation as the mechanism for the firm's adaptation to its environment. This view has strong support in the extensive literature on innovation (Kimberly 1981; Rogers 1983). Furthermore, we separate the constructs of initiation of and receptivity to innovation (innovativeness) and the implementation or adoption of innovation (capacity to innovate) because these notions are different. Finally, we treat learning orientation as a precursor to establishing a culture that is receptive to innovation.

The organizational characteristics that appear in Figure 1 as antecedents to innovativeness and the capacity to innovate come from the vast literature on the characteristics of innovative organizations. In Table 1, we present a summary of this literature. A detailed review of all these studies is beyond the scope of this article but can be found in other studies (e.g., Brown and Eisenhardt 1995; Damanpour 1991). In addition, we clarify some terms here. *Cultural characteristics* refer to the kinds of behaviors that are valued and promoted in an organization. *Structural properties*, according to Aiken, Bacharach, and French (1980), are objective aspects of an organization that cannot be deduced from or re-

TABLE 1
Summary of the Literature on Characteristics of Innovative Organizations Relevant to Market and Learning Orientation Research

Structural and Process Characteristics

Organization Size and Resources
- Organization size and wealth are among the strongest predictors of innovation (Hage and Aiken 1967; Mansfield 1963; Mohr 1969; Rogers 1983).
- Organization size and resources operate more as facilitators than as motivators of innovation (Mohr 1969).
- Resources can be thought of as means to overcome obstacles to innovation (Downs and Mohr 1976).
- Organizational characteristics that result from size can cause innovation (Aiken and Hage 1971; Baldridge and Burnham 1975).

Age
- The older the organization, the more bureaucratic and the less receptive it is to innovation (Aiken and Hage 1971).
- When there is little infusion of new members into the organization, there will be a dearth of innovative ideas from outside the organization (Pierce and Delbecq 1977).

Differentiation of the Organization
- Differentiation (diversity and specialization) can have a positive effect on the generation of innovation by promoting conflict (Siegel and Kaemmerer 1978; Thompson 1965).
- Prevents the occurrence of a dominant ideology (Mohr 1969).
- Enhances the cross-fertilization of ideas (Aiken and Hage 1971).
- Differentiation, though associated positively with developing and proposing innovative ideas, might be related negatively to adopting them because of the difficulty of obtaining agreement across different occupational groups (Wilson 1966).
- The proportion of innovative ideas adopted relative to those proposed may be lower in more diverse organizations but the absolute number will be greater (Aiken and Hage 1971; Pierce and Delbecq 1977).

Low Formalization
- Organic organizations with less formalization have a higher capacity to innovate (Burns and Stalker 1961).
- Low formalization promotes openness and flexibility in roles, which is a precondition for the initiation of new ideas (Shepard 1967), but it may hinder implementation of innovation (Zaltman, Duncan, and Holbek 1973).
- An organization needs to be able to shift or change their structures as an innovation moves through different stages (Zaltman, Duncan, and Holbek 1973).

Loose Coupling, Autonomy, and Lack of Hierarchy
- Organizations that emphasize loose coupling of groups and flat hierarchy in their structure are more innovative (Burns and Stalker 1961; Kohli and Jaworski 1990; McGuiness and Ackelsberg 1983).
- Such a structure facilitates the sharing of expertise, more open and frequent communication, and a tendency to focus on results rather that turf (McGinnis and Ackelsberg 1983).
- Higher levels of autonomy facilitate innovation (Abbey and Dickson 1983; Imai, Nonaka, and Takeuchi 1985; Siegel and Kaemmerer 1978).

Market Intelligence
- Communication, networks, and involvement with suppliers and customers facilitates innovation (Imai, Nonaka, and Takeuchi 1985).
- Environmental scanning provides an opportunity to act proactively (Day 1994; Sinkula 1994; Slater and Narver 1995).
- Sharing of market information in the organization enhances market responsiveness (Kohli and Jaworski 1990).

Planning
- Firms with a long-term rather than a short-term strategic horizon are more likely to innovate (Quinn 1988).
- Rational, comprehensive, and cross-functional planning supports innovation (Dwyer and Mellor 1991; Hise et al. 1990).
- Market-focused planning helps organizations develop new capabilities to compete (Day 1994).

Cultural Characteristics

Market Focus
- An external focus stimulates new ideas and responsiveness to markets (Day 1994; Hult 1998; Jaworski and Kohli 1993; Sinkula, Baker, and Noordewier 1997; Slater and Narver 1994, 1995).

Learning and Development
- An emphasis on individual learning and development infuses the organization with new ideas (Damanpour 1991; Hurley 1995; Katz and Tushman 1981; Marquis 1972; Thompson 1965).
- Enhances the capacity to understand new ideas (Damanpour 1991; Dewar and Dutton 1986).
- Enhances creativity and the ability to notice novel opportunities (Angle 1989).
- Aids in implementation by improving problem solving (King and Anderson 1990; McGinnis and Ackelsberg 1983; Senge 1990).

Status Differential
- Preoccupation with status and inhibitions caused by status differences in the organization impede innovation (Kanter 1983; Shepard 1967; Thompson 1965; Zaltman, Duncan, and Holbek 1973).

Participative Decision Making
- Increases involvement and the commitment to innovate (Damanpour 1991; Thompson 1965).
- Increases perceived freedom to act and innovate (Angle 1989; Scott and Bruce 1994).
- Increases information flow and communication up and down (Kanter 1983).

Support and Collaboration
- Reduces fear and increases openness and therefore encourages new ideas and risk taking (Cummings 1965; Pierce and Delbecq 1977; Scott and Bruce 1994).

- Nurtures and encourages innovative ideas (Waldman and Bass 1991).
- Increases cross-fertilization and cross-functional support of ideas (Aiken and Hage 1971; Cummings 1965).
- Signals to employees that they are valued, which encourages them to care about innovation for the good of the organization (Eisenberger, Fasolo, and Davis-Mastro 1990; Waldman and Bass 1991).

Power Sharing
- Facilitates collaboration and sharing of information and resources necessary for implementation (Kanter 1983; Thompson 1965; Van de Ven 1986).
- Reduces focus on turf, politics, and status, which may discourage people from innovation (Thompson 1965).
- Aides momentum and acceptance of new ideas (Kanter 1983; Van de Ven 1986).
- Integrated problem solving promotes innovation (Clark, Chew, and Fujimoto 1987).

Communication
- Comprehensive internal and external communication helps innovation (Ancona and Caldwell 1992; Imai, Nonaka, and Takeuchi 1985).
- Cross-functional perspective sharing helps innovation (Clark, Chew, and Fujimoto 1987; Cohen and Levinthal 1990).

Tolerance for Conflict and Risk Taking
- Conflict encourages innovation (Thompson 1965).
- Tolerance for risk taking and new ideas promotes innovation (Amabile et al. 1996; Jaworski and Kohli 1993; Kanter 1983).
- Interdepartmental conflict hurts market responsiveness (Jaworski and Kohli 1993).

duced to properties of organization members. This distinguishes structural properties from culture, which is shared and maintained by the members of an organization. *Organizational processes* are simply combinations of tasks or activities that lead to some output (Day 1994).

To summarize, market orientation per se is not critical to performance, but organizational learning and the development of firm capabilities can lead to positions of advantage (Day 1994; Slater and Narver 1995). Organizational learning, when viewed from a behavior change or implementation perspective, is equivalent to innovation. Organizational innovativeness can be conceptualized as an aspect of organizational culture that precedes innovation. Higher levels of organizational innovativeness, when combined with resources and other organizational characteristics, lead to greater innovative capacity.

Method

Figure 1 outlines the hypothesized relationships among aspects of organizational culture, the innovativeness of the culture, and the capacity to innovate. There are two parts to the model. The first part pertains to the effect of innovativeness on group outcomes. It states that, after controlling for structural effects, groups whose cultures are characterized by high levels of innovativeness will generate and adopt more new ideas, products, and processes; that is, they will manifest greater learning through the adoption of more innovations. The innovativeness of the culture will affect the capacity to innovate positively.

The second part of the model defines organizational innovativeness and sheds more light on how the innovativeness of a group's culture facilitates and motivates innovative behaviors and outcomes. The underlying premise of this part of the model is that innovativeness is related to other aspects of a group's culture that lead to the perception that the organization is receptive to new ideas. This relational view of culture is consistent with that of scholars who have conceptualized culture as a system of beliefs in which actors internalize some meaningful order with respect to the organization (Barney 1986; Schwartz and Davis 1981).

When identifying the dimensions of group or organizational culture that might be related to innovativeness, the most logical place to start is the characteristics literature (Table 1). Four aspects of culture, noted in Table 1, were selected for the purpose of testing this preliminary formulation of the construct of innovativeness. These four aspects are not meant to be an exhaustive list of all the dimensions of culture that might relate to organizational innovativeness. Practical and theoretical considerations (e.g., limitations in survey length and the interest of the sponsoring agency) influenced the decision to explore them. The purpose here is to test some of the relationships between aspects of organizational culture and innovativeness to add to our understanding of how organizations learn and adapt to their environments.

The four culture variables that we hypothesize are related to the degree of innovativeness of the culture are participative decision making, power sharing, support and collaboration, and learning and development. *Participative decision making* is the degree of openness and involvement in decision making. *Power sharing* is the degree of sharing of information, resources, and influence across levels and areas of the organization. *Support and collaboration* is the degree to which people in the group actively support and help one another in their work. *Learning and development* is the degree to which learning and development are encouraged in the organization.

Hypotheses

To summarize, innovativeness, or receptivity to new ideas and innovation, as an aspect of a group's culture affects the group's capacity to innovate. Furthermore, aspects of culture that have to do with people's participative decision making, power sharing, support and collaboration, and learning and development are associated positively with the innovativeness of the group's culture. Formally stated, the hypothesized relationships are as follows:

H_1: After controlling for certain structural properties (group size), the more a group's culture is characterized by innovativeness, the greater the number of innovative outcomes (innovative capacity) the group will produce.

H_2: The more a group's culture emphasizes participative and open decision making, the greater its cultural innovativeness.

H_3: The more a group's culture emphasizes support and collaboration, the greater its cultural innovativeness.

H_4: The more a group's culture emphasizes power sharing, the greater its cultural innovativeness.

H_5: The more a group's culture emphasizes learning and development, the greater its cultural innovativeness.

Sample

The subjects that participated in this study were employees of a large research and development agency of the U.S. federal government, for whom innovation is of vital importance. This agency can be characterized as a loose federation composed of many autonomous organizations. The entire population of the agency was surveyed. In total, 20,088 questionnaires were sent out; 9648 were returned, for a response rate of 48%. Respondents came from 10 different organizations within this agency. The unit of analysis is groups or divisions in each of the 10 different organizations in the agency. These groups ranged in size from 21 to 2229 employees. Archival data on innovative capacity were obtained from the organization's information system. In the event that data were missing, the group was excluded from the analysis. Complete information was obtained for 56 groups in the agency.

Measures

Control variables. The impact of culture was conceptualized as an addition to contextual variables. Thus, the most important of these variables, size (Mansfield 1963), needed to be controlled to detect the impact of culture. Organizational size was operationalized as the number of people in the group.

Capacity to innovate. The capacity to innovate was operationalized as the number of new ideas that had been adopted by the organization and recognized by a formal suggestion award program the agency conducted. The suggestion award program had been initiated to respond to pressure for increased efficiency and effectiveness in government operations. This pressure came from external constituencies that influenced funding and were, in effect, the "market" for this nonprofit organization. The program had been operating for six years when this study was undertaken. As it is described in the agency's personnel manual, the suggestion award program was initiated to stimulate the "best effort, creativity, and open-mindedness to new and better ways of doing our jobs from each and every employee." To be eligible, the employee had to make a suggestion that was (1) in writing and directly contributed to productivity, economy, or efficiency or directly increased the effectiveness of government operations and (2) adopted by management either in whole or in part. Awards were approved by the directors of the field installations, and there was a formal process in place, administered by a board of overseers, to ensure fairness and accuracy.

This measure serves as an indicator of the unit's innovative capacity rather than as a record of all types of innovations that were implemented by the group. Unlike Hurley's (1995) measure of innovation, which focused more narrowly on technical innovation, the measure we used is a broad measure of a firm's capacity to adapt. Furthermore, unlike the work done by Deshpandé, Farley, and Webster (1993), this measure of innovation is not a perceptual measure but instead reflects actual cases of innovation. The data we collected consisted of the number of suggestion awards given to anyone in a division during the nine months prior to and after the general administration date of the culture survey. Because organizational culture as a construct is stable over time (Schein 1985), this time frame seemed reasonable.

Group culture measures. All group culture measures (innovativeness, power sharing, participative decision making, learning and development, and support and collaboration) represent an aggregation of the individual scores of the group members to arrive at mean scores for the group. This follows from theory that posits culture as collective perceptions maintained at the group level but carried at the individual level (Van Maanen and Barley 1985). We used the Spearman-Brown test for assessing the interclass correlation (ICC), as is recommended by James (1982), to access the reliability of using mean scores to aggregate perceptions. The results justified using mean scores to measure aggregate perceptions (ICC (2) > .60 for all group culture measures).

Culture was operationalized by using an instrument developed by Burke (1989) to measure people's perceptions of group culture. All culture measures used a five-point scale ranging from "not descriptive" = 1 to "very descriptive" = 5. The respondents were asked to indicate the extent to which different items described their group. The Burke (1989) instrument was used instead of more popular measures (e.g., Deshpandé, Farley, and Webster 1993; Narver and Slater 1990) because the sponsoring organization had used this instrument in the past and was comfortable with it. The instrument also was found to be reliable and valid on the basis of commonly accepted procedures.

We employed two techniques to test the factor structure and item loadings for the five-factor group culture measurement model. We initially examined item-to-total correlations, coefficient alphas, and the factor structure (through principal components with varimax rotation) for all the scale items simultaneously. In this analysis, we achieved an unrestricted five-factor structure with the items loading on the a priori dimensions. Next, the items were subjected to a confirmatory factor analysis using LISREL (Jöreskog and Sörbom 1993) to assess the reliability and validity of the culture measures. The measurement model fit was evaluated using the DELTA2 index and the relative noncentrality index (RNI), which have been shown to be the most stable fit indices by Gerbing and Anderson (1992). Both the DELTA2 and RNI indices were .94 for the culture measurement model (for comparison purposes, a series of other fit indices appear in Table 2). The specific items were evaluated on the basis of the item's error variance, modification index, and residual covariation. The analyses support the hypothesized view of the dimensionality of the group culture measures. In Table 2, we report the items and confirmatory factor loadings for each item in the five-factor model. In addition, we

present the construct reliabilities and average variances extracted for each culture dimension.

Results

The first step in the analysis of the data was to determine the adequacy of the measure of group innovativeness on the basis of data collected from persons in each of the divisions. A one-way analysis of variance showed that there were significant differences in mean scores ($F = 3.31$, $p \leq .001$) and homogeneity of variance among the groups (Cochrans C = .034, $p \leq .10$). Descriptive statistics and correlations appear in Table 3.

With regard to H_1, we hypothesized that, after controlling for size, the greater the level of group innovativeness, the greater the innovative capacity would be (i.e., the number of suggestion awards). Multiple regression, using the hierarchical method of entry, was performed to test this hypothesis. Regression was chosen rather than a structural equations approach because of sample size limitations. The culture variable was entered last in the equation; the control variable was first. As was expected, group size, the control

TABLE 2
Culture Measures

Sample: n = 9648
Fit Indices: χ^2 = 4461.08 (degrees of freedom [df] = 160), goodness-of-fit index (GFI) = .95, adjusted goodness-of-fit index (AGFI) = .93, DELTA2 = .94, RNI = .94, comparative fit index (CFI) = .94, root mean square residual (RMSR) = .04

Innovativeness (CR = .82, AVE = 48.25%)
1. Technical innovation, based on research results, is readily accepted (FL = .51).
2. Management actively seeks innovative ideas (FL = .75).
3. Innovation is readily accepted in program/project management (FL = .80).
4. People are penalized for new ideas that don't work (R)(FL = .70).
5. Innovation in XYZ is perceived as too risky and is resisted (R)(FL = .68).

Participative Decision-Making Scale
(CR = .80, AVE = 45.38%)
1. Decision making is delegated to the lowest possible level of authority (.73).
2. Individuals involved in implementing decisions have a say in making the decisions (FL = .77).
3. Decisions are made on the basis of research, data, and technical criteria, as opposed to political concerns (FL = .47).
4. Decisions are based on open discussion and debate of facts (FL = .73).
5. Once a decision is made, management communicates the results and rationale to employees (FL = .63).

Power Sharing (CR = .75, AVE = 49.61%)
1. People are willing to share their power—there is an atmosphere of working together (FL = .67).
2. We talk about teamwork and sharing, but people quietly hold on to their power and authority (R)(FL = .70).
3. Authority is highly centralized; only a handful at the top have it (R)(FL = .74).

Support and Collaboration (CR = .72, AVE = 47.02%)
1. People throughout XYZ are supportive and helpful (FL = .85).
2. There is a willingness to accept responsibility for failure (FL = .63).
3. There is a willingness to collaborate across organizational units within XYZ (FL = .54).

Learning and Development (CR = .72, AVE = 39.33%)
1. XYZ provides opportunities for individual development other than formal training (e.g., work assignments and job rotation)(FL = .70).
2. XYZ encourages managers to attend formal developmental activities such as training, professional seminars, symposia, etc. (FL = .54).
3. There are people at XYZ who provide guidance and counsel regarding one's career (FL = .64).
4. Career management is a shared responsibility of both employee and the manager (FL = .62).

Note: R = item was reverse scored, FL = factor loading, AVE = average variance extracted, CR = construct reliability.

TABLE 3
Descriptive Statistics and Correlations for Variables

Analysis at the Group Level (n = 56 Groups)

	Mean	Standard Deviation	1	2	3	4	5	6	7
Suggestion awards	7.45	14.9	1.00						
Group size	328.7	344.9	.38*	1.00					
Innovativeness	3.46	.17	.21	.04	1.00				
Support and collaboration	3.25	.20	.00	.08	.40*	1.00			
Power sharing	2.74	.20	.00	.15	.44*	.55*	1.00		
Learning and development	3.23	.20	.13	.04	.74*	.41*	.46*	1.00	
Participative decision making	2.89	.20	.00	.08	.56*	.73*	.69*	.49*	1.00

*$p < .05$

variable, was significant. The results of the regression analysis, reported in Table 4, confirm H_1; that is, the level of group innovativeness was significantly related to the number of suggestion awards ($\beta = .33$, $t = 2.52$, $p \leq .01$). Furthermore, a commonality analysis reveals that 10.9% of the variance in the number of suggestion awards is explained uniquely by group innovativeness. The variance inflation factor (VIF) was slightly more than one, which indicates that multicollinearity was not affecting the estimates of β.

In drawing conclusions from these results, it was important to rule out a rival explanation, namely, that groups whose innovativeness scores were higher produced more suggestion awards because innovativeness is associated with award giving, not innovation. Although the presence of a formal board, which existed to ensure fairness, suggests that this rival explanation is not plausible, two empirical approaches were used to test it. First, a measure of the tendency for the group to reward and recognize people was introduced as a control variable. The measure included three items that assessed whether people were rewarded and recognized in the group (construct reliability = .79). Second, the installation to which the group belonged was coded as a dummy variable and used as a control variable. The introduction of these control variables did not change the results. Innovativeness of the group's culture remained a significant predictor of the number of innovative outcomes ($\beta = .34$, $t = 2.52$, $p \leq .01$).

H_2–H_5 hypothesized that higher levels of the four dimensions of culture at the group level (i.e., participative decision making, support and collaboration, power sharing, and emphasis on learning and development) would be associated with higher ratings of group innovativeness. Multiple regression was used to test these hypotheses. The results of the regression analysis, reported in Table 5, confirm H_2 (participative decision making) and H_5 (learning and development), but not H_3 (support and collaboration) or H_4 (power sharing).

To determine if these results were significant because of a common method problem, the sample was split using random assignment. Half the group members were used to measure the dependent variable (innovativeness), and the other half were used to measure the independent variables. The results showed that learning and development remained a strong predictor of innovativeness; however, the significance level for participative decision making dropped (from $p \leq .02$ to $p \leq .18$). Although part of this reduction is due to the removal of common method variance, some portion of it is attributable to multicollinearity (VIF for decision making = 3.1). An examination of the bivariate correlation between participative decision making and innovativeness for the split sample, in which multicollinearity is not an issue, reveals a significant relationship between innovativeness and participative decision making ($r = .30$, $p \leq .05$). Given these results, we can state that both participative decision making and learning and development are related to innovativeness, though the strength of the relationship is much greater for learning and development.

For power sharing and support and collaboration, the bivariate correlations with innovativeness were significant, but the β coefficients in both the full and split sample regression equations were not significant. This might have been partly due to multicolinearity, which is common in culture studies, and the small sample size at the group level. These results suggest that power sharing and support and

TABLE 4
Multiple Regression Explaining Innovative Capacity

Dependent Variable: Innovative Capacity

Independent Variables	β	SE β	Part Correlation	Partial Correlation	VIF*	t	Sig t
Group size	.31	.13	.30	.33	1.03	2.32	.02
Innovativeness	.33	.13	.33	.35	1.03	2.52	.01

Overall F	7.02
p	< .002
DF	(2, 45)
R^2	.23
R	.49
Adjusted R^2	.20

Commonality Analysis

Variable	R^2 Unique Contribution**
Group size	9.0%
Innovativeness	10.9
Total unique R^2	19.9%
Common	3.9
Total R^2	23.8%

*VIF = variance inflation factor.
**Based on change in R^2, when variables are entered last in the regression equation. Note that this is also equivalent to the square of the part correlation coefficient.

TABLE 5
Multiple Regression Explaining the Innovative Culture

Dependent Variable: Innovative Capacity

Independent Variables	β	SE β	Part Correlation	Partial Correlation	VIF*	t	Sig t
Participative decision making	.35	.15	.20	.30	2.9	2.3	.02
Power sharing	−.03	.12	−.02	−.03	1.9	−.28	.77
Support and collaboration	−.09	.13	−.06	−.10	2.2	−.73	.46
Learning and development	.62	.10	.53	.64	1.4	6.06	.001

Overall F	19.8
p	< .001
DF	(4, 51)
R^2	.60
R	.78
Adjusted R^2	.58

Commonality Analysis

Variable	R^2 Unique Contribution**
Participative decision making	4.1%
Power sharing	.1
Support and collaboration	.4
Learning and development	28.3
Total unique R^2	32.9%
Common	27.9%
Total R^2	60.8%

*VIF = variance inflation factor.

collaboration are less critical to innovativeness in these organizations. As is discussed in the section on limitations, it would be incorrect to conclude from these results that power sharing and support and collaboration are unimportant in all organizations and for all types of innovation. It is possible that the innovativeness of the culture may affect innovative capacity in all organizations, but the cultural antecedents of innovativeness may vary more by type of organization or innovation.

Discussion

Innovativeness and Innovative Capacity

The results indicate that, after controlling for group size, the innovativeness of a group's culture has a significant and positive effect on innovative capacity. When the group's culture is characterized by more receptivity to new ideas and innovation, it is associated with higher levels of innovation. With the number of suggestion awards as the dependent variable measuring innovative capacity, the unique variance accounted for by group innovativeness was 10.9%. The dependent variable in this study, innovative capacity, was clearly a measure of the groups' success at change and adaptation. The significant effect of organizational innovativeness on innovative capacity suggests that organizational culture and innovation are important constructs. These constructs should be addressed more fully in research on market and learning orientation, in which the primary focus is understanding the process of organizational adaptation, responsiveness, and performance. It appears that Deshpandé, Farley, and Webster (1993) are correct; organizational innovativeness is important for understanding market orientation and organizational learning, and these relationships should be explored in the context of culture.

This article suggests that research on market orientation and performance may benefit from reframing existing models to incorporate innovation more directly. The strong empirical connection between organizational innovativeness and innovative capacity found in this study supports this, as does the theoretical argument that innovation is a mechanism for organizations to adapt in dynamic environments. Introducing innovation into models of market orientation and performance could supplement or possibly even replace organizational learning constructs. Focusing on innovation has theoretical and methodological advantages.

Cultural Antecedents of Innovativeness

In trying to explain levels of group innovativeness, group cultural characteristics of participative decision making and learning and development were the most important. Participative decision making and learning and development explained 32.4% of the variance in group innovativeness (4.1% and 28.3%, respectively). This finding suggests that when members of a group are encouraged to learn and develop and able to influence group decisions, the group has more innovativeness. The strong connection between the development of people and the innovativeness of the culture is

consistent with Cohen and Levinthal's (1990) work, which indicates that the absorptive capacity of the organization is linked to the absorptive capacity of people in the firm.

The results pertaining to the antecedents of innovativeness suggest that researchers interested in proactivity and responsiveness to markets should view culture as a complex system of beliefs that affect organizational behavior. This perception is supported by the large common variance found among the four culture variables in explaining innovativeness (27.9%). Receptivity to innovation, which is at the core of adaptiveness and change, is related systematically to other dimensions of culture.

Recognizing that various aspects of a firm's culture can affect organizational innovativeness has strategic implications. Leaders cannot simply select an organization's culture; they must shape it (Barney 1986; Hunt and Morgan 1995). Organizations may want innovation, but when their implicit norms and values reinforce the status quo, it is not forthcoming. This is consistent with Quinn's (1988, p. 125) view that "continuous innovation occurs largely because a few key executives have a broad vision of what their organizations can accomplish for the world and lead their enterprises toward it. They appreciate the role of innovation in achieving their goals and consciously manage their concerns' value systems and atmospheres to support it." Our findings suggest that creating a more innovative culture requires a change in the system, because people's beliefs about innovation are related to beliefs about other aspects of the system (e.g., participative decision making and learning and development).

Innovation, Market Orientation, and Nonprofit Organizations

In the conceptual model presented in Figure 1, we attempt to locate market and learning orientations as aspects of culture in a framework that explains how organizations implement new behaviors and develop competitive advantage. In the empirical portion of this article, we concentrate only on the constructs of learning, innovativeness, and innovative capacity and therefore do not deal directly with market orientation. The relationship between market orientation and innovation has been noted by other researchers (see Table 1) and is intuitive. We attempt to make this link conceptually to be consistent with the theoretical portion of the article, which takes a more comprehensive perspective.

By definition, people in a market-oriented, nonprofit organization think about, talk about, and act in ways that respond to the external environment. This market orientation is a source of new ideas and motivation to respond to the environment. Thus, similar to learning and development and participative decision making, market orientation promotes a receptivity to innovation (innovativeness) in a group's culture. When an organization has both a culture that values innovation and the necessary resources (e.g., size), it will have a greater capacity to innovate. Thus, market and learning orientation are antecedents to innovativeness.

Framing the market and learning orientation paradigm in terms of innovation facilitates the inclusion of nonprofit organizations in this line of research. Although the definition of markets must be tailored to reflect the complexity of external relationships in organizations such as hospitals, universities, and government agencies, understanding the mechanisms by which these organizations respond to their environments is vitally important.

Limitations and Further Research

Several limitations and opportunities for additional research can be identified from this research. We review the limitations first, followed by ideas for further research.

Range of variables. Because of the limitations the sponsoring agency placed on the variables that could be measured, market orientation and some other variables that were in the conceptual model could not be examined empirically. Therefore, the empirical part of this article is only a partial test of the conceptual model. Also, much like Jaworski and Kohli's (1996) idea that the quality of market-oriented behaviors may differ, so too the value of innovations may differ. This is not addressed in our study. Nevertheless, we highlight some critical relationships in the model that examine organizational learning, innovativeness, and innovative capacity. The significant effect of organizational innovativeness on innovative capacity provides strong evidence for including innovation constructs in this line of research.

Generalizability. Our research made use of data that are rare, in that they included culture measures that use many informants in each group, as well as objective measures of innovations that represent efforts to adapt to the external environment and change. This improves on research that uses perceptual measures of innovation (Deshpandé, Farley, and Webster 1993) or that focuses more narrowly on scientific or technical innovation (Hurley 1995). The results thus provide a rich description of the organizational processes and outcomes of innovation. However, care should be exercised in generalizing these results to other populations because all the respondents and groups were from a single agency of the U.S. government.

In terms of further research, we can make several recommendations to advance research in this area. First, more work must be done to untangle the constructs of entrepreneurship and innovation. More research is needed to understand the role of new businesses and commercialization (entrepreneurship) versus implementing new ideas, processes, or products (innovation) in market orientation and performance. Second, innovation should be incorporated into future models of how organizations adapt to their environments and how this affects performance. This framework is compatible with many of Day's (1994) views of the relationship between market orientation and the development of capabilities that enhance competitive advantage. As part of introducing innovation constructs, the relationship among organizational innovativeness, learning, and market orientations should be examined in more depth. One way that this could be accomplished would be to extend current research by adopting a process perspective. Most of the research to date has focused on describing the attributes of market- and learning-oriented firms. Taking a process approach and examining how firms innovate and develop new capabilities to compete, along with the role of learning and market orienta-

tion in the process, should enhance our understanding of how firms learn, change, and perform. Finally, more work must be done that pertains to market and learning orientation among nonprofit organizations. Many nonprofit organizations (e.g., government agencies, universities, hospitals) are under tremendous pressure to change. More research is needed to determine how these bureaucratic organizations can become more market oriented.

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